

What is claimed is:

- 1 1. A base for a molten metal pump, the base comprising:
2 a pump chamber;
3 a discharge in communication with the pump chamber, the discharge including a
4 first section having a first cross-sectional area and a second section having a second cross-
5 sectional area, the second section being downstream of the first section and the second cross-
6 sectional area being larger than the first cross-sectional area; and
7 a gas-release opening in communication with one or more of the group consisting
8 of the first section and the second section.
- 1 2. The base of claim 1 wherein the gas-release opening is positioned in the second
2 section.
- 1 3. The base of claim 2 wherein the gas-release opening is positioned along a side wall of
2 the second section.
- 1 4. The base of claim 2 wherein the gas-release opening is positioned near a top wall of
2 the second section.
- 1 5. The base of claim 1 wherein the gas-release opening is positioned in the first section.
- 1 6. The base of claim 5 wherein the gas-release opening is positioned in a top wall of the
2 first section.
- 1 7. The base of claim 2 wherein the gas-release opening is positioned within 3" of the first
2 section.
- 1 8. The base of claim 1 wherein the discharge is fully enclosed.

- 2 9. The base of claim 1 wherein the second cross-sectional area is between 110% and
3 350% larger than the first cross-sectional area.
- 1 10. The base of claim 1 wherein the discharge further includes a third section having a
2 third cross-sectional area, the third section being downstream of the second section and
3 the third cross-sectional area being larger than the first cross-sectional area but smaller
4 than the second cross-sectional area.
- 5 11. The base of claim 1 that is comprised of graphite.
- 1 12. A molten metal pump including:
2 a base for a molten metal pump, the base comprising:
3 a pump chamber;
4 a discharge in communication with the pump chamber, the discharge including a
5 first section having a first cross-sectional area and a second section having a second cross-
6 sectional area, the second section being downstream of the first section and the second cross-
7 sectional area being larger than the first cross-sectional area; and
8 a gas-release opening in communication with one or more of the group consisting
9 of the first section and the second section.
- 1 13. The molten metal pump of claim 12 that further comprises a gas-transfer conduit, the
2 gas-transfer conduit having an end including the gas-release opening and an opposite
3 end connected to a gas source, wherein gas from the gas source can pass through the
4 gas-transfer conduit, through the gas-release opening and into the discharge.
- 1 14. The molten metal pump of claim 12 that further includes a metal-transfer conduit
2 connected to the discharge.

- 1 15. The molten metal pump of claim 12 wherein the gas-release opening is positioned in
2 the second section.
- 1 16. The molten metal pump of claim 15 wherein the gas-release opening is positioned less
2 than 12" from the first section.
- 1 17. The molten metal pump of claim 15 wherein the gas-release opening is positioned
2 within 3" of the first section.
- 1 18. The molten metal pump of claim 12 wherein the discharge is fully enclosed.
- 1 19. The molten metal pump of claim 12 that further includes a device positioned in a pump
2 chamber in the pump base, the device having a displacement structure and an inlet
3 structure defining one or more inlets wherein the displacement structure and the inlet
4 structure rotate as the device rotates.
- 1 20. The pump of claim 15 wherein the gas-release opening is positioned near a top wall of
2 the second section.
- 1 21. The pump of claim 12 wherein the gas-release opening is positioned in the first section.
- 1 22. The pump of claim 21 wherein the gas-release opening is positioned near a top wall of
2 the first section.
- 1 23. The pump of claim 12 wherein the discharge further includes a third section having a
2 third cross-sectional area, the third section being downstream of the second section and
3 the third cross-sectional area being larger than the first cross-sectional area but smaller
4 than the second cross-sectional area.
- 1 24. A metal-transfer conduit for connecting to a molten metal pump base, the metal-
2 transfer conduit having a first section with a first cross-sectional area and a second
3 section with a second cross-sectional area, the second cross-sectional area being greater

- 4 than the first cross-sectional area and a gas-release opening in communication with one
5 or more of the group consisting of the first section and the second section.
- 1 25. The metal transfer conduit of claim 24 wherein the gas-release opening is positioned in
2 the second section.
- 1 26. The metal-transfer conduit of claim 24 wherein the gas-release opening is positioned
2 within 3" of the first section.
- 3 27. The metal-transfer conduit of claim 24 wherein the second section has a side wall and
4 the gas-release opening is positioned near the side wall.
- 1 28. The metal-transfer conduit of claim 23 wherein the second cross-sectional area is
2 between 110% and 350% of the area of the first cross-sectional area.
- 3 29. The metal-transfer conduit of claim 24 that is made of graphite.
- 4 30. The metal-transfer conduit of claim 25 wherein the gas-release opening is positioned
5 within 12" of the first section.
- 1 31. The metal-transfer conduit of claim 25 wherein the gas-release opening is positioned
2 near a top wall of the second section.
- 1 32. The metal-transfer conduit of claim 24 wherein the gas-release opening is formed in
2 the first section.
- 1 33. The metal-transfer conduit of claim 32 wherein the gas-release opening is formed in a
2 top wall of the first section.
- 1 34. The metal-transfer of claim 24 wherein the second cross-sectional area is between
2 110% and 350% larger than the first cross-sectional area.
- 1 35. The metal-transfer conduit of claim 24 wherein the discharge further includes a third
2 section having a third cross-sectional area, the third section being downstream of the

3 second section and the third cross-sectional area being larger than the first cross-
4 sectional area but smaller than the second cross-sectional area.

1 36. The base of claim 1 wherein there is as-release opening in communication with the
2 first section and a gas-release opening in communication with the second section.

1 37. The pump of claim 12 wherein there is a gas-release opening in communication with
2 the first section and a gas-release opening in communication with the second section.

1 38. The metal-transfer conduit of claim 24 wherein there is a gas-release opening in
2 communication with the first section and a gas-release opening in communication with
3 the second section.